MEMORANDUM FOR: Distribution

FROM: W/OPS1 - John McNulty

SUBJECT: Expansion of Console Replacement System (CRS)

1. Material Transmitted:

    Engineering Handbook No. 7 (EHB-7), Communications Equipment, section 3.4,
    Modification Note 54, Console Replacement System Output Channel Expansion
    (Large 6 to a Maximum 10).

2. Summary:

    Request for Change NWS661 REV1 authorizes CRS expansion for Weather
    Forecast Office Little Rock, Arkansas (LZK).

3. Effect on Other Instructions:

    None.

    Distribution:
    W/OPS11 - D. Bosco   W/OS612 - R. Nedved
    W/OPS12 - J. Earl   W/SR41x5 - S. Baker
    W/OPS12 - G. Sikora   W/WFO - FFC - B. Brodnax
    W/OPS13 - J. Sabel (2)   W/WFO - FWD - T.L. Farrow
    W/OPS13 - M. Brown   W/WFO - LIX - L. Tennison
    W/OPS13 - S. Reiley   W/WFO - LUB - P. Shideler
    W/OPS16 - A. Morris   W/WFO - TBW - N. Jester
    W/OPS23 - A. Jarvi   W/WFO - EWX - T. Hempen
    W/OPS23 - L. Lehman   W/WFO - EHU - H. Crowe
    W/OPS23 - J. Nathan   W/WFO - EHU - C. Lake
    W/OPS32 - K. Putkovich   W/WFO - EHU - C. Tevis
    W/OPS32 - W. Hart   W/WFO - LZK - P. Siebenmorgen (2)
    W/OS12 - R. Gillespie

COMMUNICATIONS EQUIPMENT MODIFICATION NOTE 54 (for Electronics Technicians)
Maintenance Branch
W/OPS12: GSS

SUBJECT   :   Console Replacement System (CRS) Output Channel Expansion

PURPOSE   :   To expand the capabilities of the CRS system from a Large 6-channel
                         to a Maximum 10-channel configuration.

SITES   :   Site Name   SID   Org. Code
AFFECTED   WFO Little Rock, AK   LZK   WP9340

EQUIPMENT   :   CRS (B440)
AFFECTED

PARTS REQUIRED   :   The parts required will be issued to each site by W/OPS12 from the
                         National Logistics Support Center under the applicable approved site-
                         specific Request for Change.

                         (1) Front-end processor (FEP) hold down strap (ASN: B440-STRAP)
                         (1) FEP computer (ASN: B440-2A2)
                         (1) FEP hard disk drive (ASN: B440-2A2A8-FEP)
                         (1) Local area network (LAN) board (ASN: B440-1A8A10)
                         (1) LAN cable segment (ASN: B440-2W1)
                         (1) BNC tee connector (ASN: B440-4J1)
                         (1) FEP switch VGA video cable (ASN: B440-2W3)
                         (1) FEP switch PS/2 keyboard cable (ASN: B440-2W4)
                         (4) DECtalk cards (ASN: B440-2A2A11)
                         (4) Audio Switch Module (ASM) cards (ASN: B440-2A6A3)
                         (4) DECtalk-ASM audio cable (ASN: B440-4W12)
                         (4) NOAA Weather Radio Specific Area Message Encoder
                         (NWRSAME)-Audio Control Panel (ACP) interface cable
                         (ASN: B440-1A5W4)
                         (1) DOS formatted diskette with CRS test database ASCII files
                         (provided by W/OPS12)

PARTS SUPPLIED   :   The following parts will provided by the site:
BY THE SITE   (4) Transmitter audio output cables
                         (4) NWRSAMEs (if available)
                         Cable marking tags and tie-wraps as needed

TOOLS AND TEST EQUIPMENT REQUIRED	:	#1 and #2 Phillips screwdrivers CRS test database ASCII files diskette provided by W/OPS12 (see Parts Required) Small flat-blade jeweler's screwdriver Root mean square (RMS) voltmeter/dB meter 600-ohm dummy load with a RJ-11 plug attached Antistatic workstation kit
TIME REQUIRED	:	5 Hours
EFFECT ON OTHER INSTRUCTIONS	:	None
AUTHORIZATION	:	The authority for this modification is Request for Change NWS661 REV 1.
VERIFICATION STATEMENT	:	This procedure was tested and verified at National Weather Service Headquarters, Silver Spring, Maryland (SLVM2).
GENERAL	:	This procedure contains instructions to add output channel(s) to the CRS system and is contained in the attachments.
PROCEDURE	:	Attachment **A** provides procedures for implementing this modification. Attachment **B** (CRS Hardware Drawings) provides reference information. Attachment **C** provides verification of the new physical configuration (used before applying power). Attachment **D** provides a completed sample of WS Form A-26, Maintenance Record.

REPORTING   :   Report the completed modification on WS Form A-26,
INSTRUCTIONS   Maintenance Record, according to the instructions in Engineering
Handbook No. 4 (EHB-4), Engineering Management Reporting System
(EMRS), part 2, and EHB-4, appendix I. Include the following
information on the A-26:

    a.   An equipment code of '**CRSSA**' in block 7.
    b.   A serial number of '**001**' in block 8.
    c.   A Mod No. of **54** in block 17a.

A sample WS Form A-26, Maintenance Record, is provided as
attachment D.

John McNulty
Chief, Maintenance, Logistics, and Acquisition Division

Attachment A - Modification Procedure
Attachment B - CRS Hardware Drawings
Attachment C - New Configuration Physical Verification
Attachment D - WS Form A-26 Sample

Attachment A

Modification Procedure

Attachment A
Modification Procedure

Overview

This modification note provides instructions for expanding a Console Replacement System (CRS) from a LARGE 6-channel configuration to a MAXIMUM 10-channel configuration. The modification procedure contains seven parts:

1. CRS Power-Down Procedures
2. Equipment Upgrade Procedures
3. CRS Power-Up Procedures
4. CRS Login, Application Software Error Verification, and Test Database ASCII File Loading Procedures
5. Post Hardware Expansion Channel Operability Verification Procedures
6. Adding New Transmitter Channels and Editing Site Database ASCII File Procedures
7. ASM Alignment Procedures

NOTE: 1. Read the entire procedure and verify receipt of all required parts before proceeding with the actual modification.

2. Coordinate with the operations staff before performing this procedure.

CAUTION

CRS must be down to perform the expansion modification. This modification contains test messages that should not be broadcast on any transmitter.

In addition, the database ASCII file will be recompiled and all dictionary files will be lost! Switch to the backup NWR system, and ensure the dictionary files are backed up (see the *CRS System Administration Manual*) before performing this modification.

NOTE: The new FEP setup procedures in part 2, sections 2.1, 2.2, and 2.3, can be performed prior to shutting down the system. This will save downtime of a CRS system that is currently operational.

PART 1 CRS POWER-DOWN PROCEDURES

1.1   CRS Application Shutdown Procedure

      1.   Click on the **System** menu and click on **Stop System**.

      2.   Wait until all icons on the *CRS System Status* menu turn **red**.

1.2 UNIX Shutdown Procedure

NOTE: 1.   The shutdown of the CRS application is just one task before the graceful power-down. After stopping the CRS application software, implement a "controlled/orderly UNIX shutdown with NO automatic reboot" on the main processor (MP), and implement a "controlled/orderly UNIX shutdown" on all FEPs. Upon completion of the controlled/orderly UNIX shutdown, power-down the processors in the following order: MPs first followed by the FEPs.

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      1.   Click on the **Maintenance** menu in the main CRS menu to access the *Maintenance* pull-down menu.

      2.   Click on **UNIX Shell** in the *Maintenance* pull-down menu. A *UNIX xterm* window pops up for the entry of UNIX commands.

      3.   Type the following UNIX command in the *xterm* window:
              su root

      4.   Press the **Enter** key. The shell responds with a prompt to enter root passwords.

      5.   Type the password for the root.

      6.   Press the **Enter** key. The shell prompt changes to a pound sign indicating all subsequent UNIX command entries have root authority.

      7.   Type the following UNIX command in the *xterm* window:
              rsh 5MP /sbin/shutdown -i0 -g0 -y

      8.   Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 5MP. UNIX on processor 5MP shuts down.

      9.   Type the following UNIX command in the *xterm* window:
              rsh 1FEP /sbin/shutdown -i0 -g0 -y

     10.   Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 1FEP. UNIX on processor 1FEP shuts down.

     11.   Type the following UNIX command in the *xterm* window:
              rsh 2FEP /sbin/shutdown -i0 -g0 -y

12.   Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 2FEP. UNIX on processor 2FEP shuts down.

13.   Type the following UNIX command in the *xterm* window:
rsh 4BKUP /sbin/shutdown -i0 -g0 -y

14.   Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 4BKUP. The UNIX on processor 4BKUP shuts down.

15.   Type the following UNIX commands in the *xterm* window:

   a.   **cd /**

   b.   Press the **Enter** key.

   c.   **/sbin/shutdown -i0 -g0 -y**

   d.   Press the **Enter** key. Each CRS processor for the system may be safely powered down when UNIX indicates shutdown is complete with the following message:
   Press any key to reboot

NOTE: 2.   Do not reboot any machine, go to section 1.3.

1.3 CRS Hardware Power-Down Procedure

Power-down all CRS equipment at the operator's station and in the equipment room by turning off the following:

Operators Station	Equipment Room
0MP and Monitor	4BKUP
5MP and Monitor	1FEP
NWRSAME (all)	2FEP
	LAN Bridge
	LAN Server
	Monitor
	Printer
	Audio Switching Assembly (ASA) Power Supplies
	Modem

PART 2 EQUIPMENT UPGRADE PROCEDURES

NOTE: The new FEP setup procedures in part 2, sections 2.1, 2.2, and 2.3, can be performed prior to shutting down the system. This will save downtime of a CRS system that is currently operational.

2.1 Preliminary 3FEP Setup Procedure

NOTE: Removing and replacing circuit cards must be accomplished in an antistatic work area using approved antistatic procedures.

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1. Remove the right side cover of the new 3FEP unit using the following procedure:

   a. Remove the right three screws located on the back of the system unit (see attachment **B,** figure A-1). These screws secure the right side access panel of the system to the chassis.

   b. Pull the panel backward while lifting it upward.

2. Remove the screws holding expansion slot covers 1, 2, 3, 4, and 6, and retain the screws (see attachment **B**, figure A-13).

3. Remove the expansion slot covers.

4. Install the new LAN card (ASN: B440-1A8A10) in expansion slot number 1, and reinstall a retaining screw.

2.2 Installation of the Hard Disk Drive (HDD) and Cage Combination Procedure

1. Align the three slides on the HDD cage with the three slots on the upper left corner of the chassis.

2. Insert the slides into the slots holding the HDD cage at an angle away from the chassis.

3. Slide the HDD cage towards the bottom of the chassis; swing the HDD cage into the chassis body.

4. Align the two screw slots at the top with the threaded holes in the chassis, and secure the HDD cage with two screws.

5. Secure the HDD cage with a single screw at the tab located at the lower right corner of the HDD cage (see attachment **B**, figure A-13).

6. Hook up the hard disk drive cable to the HDD. Cable connectors are keyed and only fit one way. Connect the other end of the HDD cable to the small computer system interface (SCSI) port on 3FEP motherboard.

7.   Connect a power connector from the power supply to the hard disk drive.

2.3 DECtalk Cards Input/Output (I/O) Address Configuration and Installation Procedure

1.   Configure each new DECtalk card for the appropriate I/O address through switch 2 (SW2) as defined in table 1 and pictured in attachment **B**, figure A-11.

NOTE:	1.	Depending on the CRS site configuration, there may be as many as five DECtalk cards per FEP, located in slots two through six.

Table 1. DECtalk Card Switch 2 (SW2) Settings

Module Number	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	I/O Address	PC Slot
4	off	off	off	off	on	on	380	6
3	off	off	on	on	off	on	360	5
2	on	off	on	off	off	on	328	4
1	off	on	off	on	off	off	250	3
0	off	off	off	on	off	off	240	2

NOTE:	2.	Regardless of FEP, DECtalk card configuration remains constant, meaning modules 0, 1, 2, 3, and 4 are configured the same for each FEP.

2.   Use table 1 to set up a DECtalk card with the I/O address: 240
        Install the DECtalk card into slot 2 of 3FEP, and reinstall a retaining screw.

3.   Use table 1 to set up a DECtalk card with the I/O address: 250
        Install the DECtalk card into slot 3 of 3FEP, and reinstall a retaining screw.

4.   Use table 1 to set up a DECtalk card with the I/O address: 328
        Install the DECtalk card into slot 4 of 3FEP, and reinstall a retaining screw.

5.   Use table 1 to set up a DECtalk card with the I/O address: 380
        Install the DECtalk card into slot 6 of 3FEP, and reinstall a retaining screw.

6.   Replace the 3FEP covers removed using the reverse procedure in section 2.1, step 1.

NOTE:	3.	Perform part 1, CRS Power-down Procedure, before proceeding.

2.4 3FEP Computer Installation Procedure

1.   Install 3FEP in the CRS Main Unit Cabinet.

2.   Install the new 3FEP Switch VGA Video Cable (ASN: B440-2W3) between 3FEP video out and switch position C.

3.   Install the new FEP Switch PS/2 Keyboard Cable (ASN: B440-2W4) between 3FEP keyboard connection and switch position C.

4.   Install the new LAN cable segment (ASN: B440-2W1) and BNC tee (ASN: B440-4J1) connector to connect the 3FEP PC into the existing CRS LAN; 3FEP connects between 2FEP and 5MP (see attachment **B**, figure A-15).

2.5 ASM Card Installation Procedure

1.   Remove audio switching assembly (ASA) slot 7, 8, 9, and 10 covers by removing the two screws.

NOTE: There are five jumpers to be set on each ASM card.

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2.   Take one of the new ASM cards (ASN: B440-2A6A3), and set the jumpers for slot 7 of the ASA in accordance with table 2.

Table 2. ASM Card Jumper Settings

	ASA Slot #	Silence Alarm Jumper "JP1"	ACP Channel Sel. Jumper "JP2" & "JP3"	BKUP Live/ Playback Cntrl Jumper "JP4"	FEP Select Jumper "JP5"
ASM 1 (channel 1)	1	EN (Enable)	1	BUL2	FEP1
ASM 2 (channel 2)	2	EN (Enable)	2	BUL2	FEP1
ASM 3 (channel 3)	3	EN (Enable)	3	BUL2	FEP1
ASM 4 (channel 4)	4	EN (Enable)	4	BUL2	FEP2
ASM 5 (channel 5)	5	EN (Enable)	5	BUL2	FEP2
ASM 6 (channel 6)	6	EN (Enable)	6	BUL2	FEP2
ASM 7 (channel 7)	7	EN (Enable)	7	BUL2	FEP3
ASM 8 (channel 8)	8	EN (Enable)	8	BUL2	FEP3
ASM 9 (channel 9)	9	EN (Enable)	9	BUL2	FEP3
ASM 10 (channel 10)	10	EN (Enable)	10	BUL2	FEP3
ASM PB1 (mon/playback chan 1)	PB1	DIS (Disable)	PB1	PB	FEP1
ASM PB2 (mon/playback chan 2)	PB2	DIS (Disable)	PB2	PB	FEP2

3. Install the new ASM card into slot 7 of the ASA chassis, and tighten the two screws.

4. Repeat steps 2 and 3 for each of the remaining ASM cards.

2.6 New DECtalk-ASM Audio Cable Installation Procedure

Mark write-on cable labels, and connect the DECtalk-ASM audio cables in accordance with table 3.

Table 3. DECtalk to ASM Audio Cables

From	To	Cable Label
1FEP DECtalk 1 "J2" Port	ASM 1 "IN Port"	1-1
1FEP DECtalk 2 "J2" Port	ASM 2 "IN Port"	1-2
1FEP DECtalk 3 "J2" Port	ASM 3 "IN Port"	1-3
2FEP DECtalk 1 "J2" Port	ASM 4 "IN Port"	2-1
2FEP DECtalk 2 "J2" Port	ASM 5 "IN Port"	2-2
2FEP DECtalk 3 "J2" Port	ASM 6 "IN Port"	2-3
3FEP DECtalk 1 "J2" Port	ASM 7 "IN Port"	3-1
3FEP DECtalk 2 "J2" Port	ASM 8 "IN Port"	3-2
3FEP DECtalk 3 "J2" Port	ASM 9 "IN Port"	3-3
3FEP DECtalk 5 "J2" Port	ASM 10 "IN Port"	3-5
1FEP DECtalk 5 "J2" Port	ASM PB1 "IN Port"	1-5
2FEP DECtalk 5 "J2" Port	ASM PB2 "IN Port"	2-5

2.7 New Transmitter Audio Output Cables Installation Procedure

1. Install the new audio output cable for connecting the OUT 1 port of the new ASM cards at slots 7, 8, 9, and 10 of the ASA chassis to the Demarc Panel position for the new transmitters.

2. Install the new NWRSAME (if available) into the top panel of the 5MP workstation (if available).

3. Install the Encoder-ACP interface cable from the NWRSAME rear connector to the NWRSAME INPUT 1 port of ACP2 rear panel (this connects to pins 2, 6, 7, 9, and 10 of the NWRSAME), if available.

NOTE: This completes the hardware modification.

PART 3 CRS POWER-UP PROCEDURES

WARNING

Prior to powering-up the FEPs, perform the *New Configuration Physical Verification* procedure contained in attachment C to verify proper system configuration. Failure to perform the procedure can result in transmitter broadcasts assigned to incorrect output channels.

3.1 Power-Up FEP Procedure

    1.   Press the **ON/OFF** switch (located on the front center right of the enclosure) to power-up the FEPs. A green power LED on each FEP will be lit indicating that power is on. The FEPs can be powered-up in any sequence. The FEPs go through a memory check, display the system configuration [as recognized by the basic I/O system (BIOS)], then boot the embedded operating system. At the completion of the boot process, the console screen displays the prompt, **Console Login:**. The embedded operating system automatically initializes to a preset level and then waits for final start-up commands from the master MP.

NOTE: The FEPs share a common console through the Shared Monitor Switch. The console displays messages while completing the boot process of the FEP currently switched in.

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    2.   Use the *Shared Monitor Switch* to select the next FEP. The console monitor displays:
         Press <F1> to resume, <F2> to Setup.

    3.   Press **F1** to complete the boot process. The prompt displays:
         Console Login:

    4.   Repeat for each remaining FEP.

3.2 Power-Up Main Processors Procedure

NOTE: 1. Power-up 0MP as the master main processor and 5MP as the shadowing processor.

    Press the **ON/OFF** switch (located on the front center right of the enclosure) to power-up the MPs. A green power LED on each MP lights indicating that power is on. The MPs can be powered-up in any sequence. The MPs go through a memory check, file system

check, system configuration verification (as recognized by the BIOS), and then boot the embedded UNIX operating system. At the completion of the boot process, the workstation screen displays the *CRS Login* screen. The MPs are now ready for the initialization of the CRS application software.

NOTE: 2.   For Build 6.4 and higher: Following power-up, CRS displays the *Security Screen*. The operator must acknowledge the Security Screen by clicking on the **Acknowledge** button to continue the login process.

3.   Whenever the MPs are powered-up, they automatically step through the boot process to the multiuser mode without operator intervention.

3.3 CRS Application Software Installation on the New FEP Procedure

1. From an MP workstation at the *CRS Login Screen*, type **root** (to logon as root) in the *Login ID* field, and press **Enter**. The cursor moves to the *Password* field.

2. Type in your assigned password, and press **Enter** to complete the CRS login process. The system displays the *UNIXWare Desktop*.

3. Double-click the **Admin_Tools** icon from the *UNIXWare Desktop*. The *Admin Tools* window displays.

4. Double-click the **App_Installer** icon from the *Admin Tools* window. The *Application Installer* window displays. This window is divided into two windows. All procedures that follow are accomplished in the upper window.

NOTE: 1.   You will need the CD that has your current version of software loaded on the CRS system.

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5. Place the CD with the CRS software into the CD-drive.

6. Select **CD-ROM_1**, from the upper window, as your media to install. Three icons display: **crsopsais** (auto installer), **crsopsfpm** (FEP multi-pack), and **crsopsmpm** (MP multi-pack).

7. Select **crsopsais**, and click the **Install** button on the right side of the upper window. The *auto_install* window displays and the installation script starts. The installation script stops for you to make a selection of the installation type. The following statements display:

   Build installation options.
   a) all processors (0MP, 5MP, 1FEP, 2FEP, 3FEP, 4BKUP)
   f) front-end processors (1FEP, 2FEP, 3FEP, 4BKUP)
   m) master processors (0MP, 5MP)
   s) specific processor
   Select Installation Option (default: a)

8. Type **a** and press **Enter**. Numerous installation status messages on the *auto_install* window display. Follow the on-screen instructions, and answer any questions asked. When the installation process completes, the CRS displays:
   Continue 0MP shutdown? (default: y)

9. Press **Enter** to reboot 0MP.

NOTE: 2. For Build 6.4 and higher: Following power-up, CRS displays the *Security Screen*. The operator must acknowledge the *Security Screen* by clicking on the **Acknowledge** button to display *Login* screen and continue the login process.

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10. Use the *Shared Monitor Switch* on the equipment rack to select the next FEP for rebooting. The console monitor displays:
    Press <F1> to resume, <F2> to Setup.

11. Press **F1** to complete the boot process. The prompt displays,
    Console Login:

12. Repeat for each remaining FEP.

PART 4 CRS LOGIN, APPLICATION SOFTWARE ERROR VERIFICATION, AND TEST DATABASE ASCII FILE LOADING PROCEDURES

4.1 CRS Login Procedure

NOTE: 1.   For Build 6.4 and higher: Following power-up, CRS displays the *Security Screen*. The operator must acknowledge the *Security Screen* by clicking on the **Acknowledge** button to continue the login process.

             2.   The *CRS Login Screen* allows you to log onto CRS. This screen contains two fields, i.e., *Login ID* and *Password*. The fields are provided to allow you to type in your assigned login ID and password.

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1.   Type **admin** (for system administrator) in the *Login ID* field, and press **Enter**. The cursor moves to the *Password* field.

2.   Type in your assigned password, and press **Enter** to complete the CRS login process. The system displays the *CRS Main* display. In addition, the system displays the following error message:
System is not operational. Perform 'Start CRS' to start system.

3.   Click on **OK** to clear the message.

NOTE: 3.   The error message is only a status message indicating that CRS is not running.

4.2 CRS Applications Software Installation Error Verification Procedure

1.   Open a *UNIX Shell*:

     a.   Click on **Maintenance**

     b.   Click on **UNIX Shell**

2.   Type **grep ERROR /crs/install.log** and press **Enter**.

3.   Ensure there are no error messages. Any error messages must be reported to the CRS Site Support Staff at 301-713-0191x145 or x144.

4.   Type **grep WARNING /crs/install.log** and press **Enter**.

5.   Ensure there are no error messages. Any error messages must be reported to CRS Site Support Staff at 301-713-0191x145 or x144.

NOTE: Ignore any IP address error messages.

4.3 CRS Test Database ASCII File Loading Procedure

NOTE:	1.	The following instructions for loading the CRS test database ASCII file assume that everything is being done with 0MP set as the MP.

1. Place the diskette with CRS test database ASCII files in the 0MP diskette drive to copy the desired file from the diskette to CRS.

    a. Type **dosdir a:** and press the **Enter** key to display a directory listing of the files on the test database diskette. There are 13 files on the diskette with the following filename convention:

        TYP*W*_CFG.ASC   where *W* = 1 - 4
        LRG*X*_CFG.ASC   where *X* = 5 - 8
        MAX*Y*_CFG.ASC   where *Y* = 9
        MAX*Z*_CF.ASC   where *Z* = 10 - 13
        (*W*, *X*, *Y*, and *Z* represent the number of channels supported by your CRS)

    b. Locate the applicable test database ASCII file.

    c. Type **doscp a:*filename* /crs/data/SS/*filename***.

NOTE:	2.	Where ***filename*** is the name of the CRS test database ASCII file to be used.

    d. Press the **Enter** key.

2. Click and hold the left mouse button on any white space, move the cursor to select **XCRS_SITE Utility,** and release the button to bring up the *XCRS_SITE Utility* window.

3. Click on the **Select ASCII Site Setup** button to bring up the list of ASCII files.

4. Select the desired database ASCII filename that you copied from the diskette in section 4.3, step 1.c, and double click.

NOTE:	3.	The directory selection block has a default directory name of /crs/data/SS, and the file filter block has a default file name of /crs/data/SS/*.ASC. If the desired filename does not appear, it may have copied to the wrong directory in section 4.3, step 1.c. If that is the case, change the default directory name to the directory specified in section 4.3, step 1.c. The other reason the filename does not appear is because it is being filtered out. Remember, UNIX is case sensitive and if copied with an asc extension that was in lower case it does not display. Change the filter file name to **/crs/data/SS/*.asc** and the filename displays.

5.	Select **Initialize System Configuration and Database** to ensure the entire system database and configuration is erased and replaced.

6.	Click on the **Start Site Configuration** button. The system displays:
Will now perform FULL site reconfiguration. Continue?

7.	Click on **OK**. The "wristwatch" and the "working" message display. Several messages scroll by. The last message reads:
Finished with site configure

	The "wristwatch" and "working" message disappear. Ensure there are no error messages at the completion of the site configuration process.

8.	Restart CRS by clicking on **Start CRS System**. The system displays:
The CRS system will be STARTED. Continue?

9.	Click on **OK**. The "wristwatch" and the "working" message display. Several messages scroll by. The last message refers to starting 4BKUP. The "wristwatch" and "working" message disappear.

10.	Click on **Exit** to close the *XCRS_SITE Utility* window.

11.	Click on the **UNIX shell** window to select it. At the prompt, type **Exit** and press **Enter** to close the *UNIX Shell*.

12.	Open the *System Status* window.

	a.	Click on **System**.

	b.	Click on **System Status**.

13.	Monitor the *System Status* window, and ensure the system is operational.

PART 5 POST HARDWARE EXPANSION CHANNEL OPERABILITY VERIFICATION PROCEDURES

5.1 Channel Operability Verification Procedure

NOTE:	The CRS test database ASCII files contain test messages configured for continuous broadcast for channel operability verification.

1.	Connect a monitor speaker or headphones to the ACP.

2.	Use the **Channel Select** control to select each channel, one at a time, and monitor the output for the correct message (i.e., with channel one selected, the message output is: *This is transmitter one, audio switch module one.*).

5.2 FEP Backup Mode Channel Operability Verification Procedure

1.   Click on **Maintenance**.

2.   Click on **Front-End Processor Switch**.

3.   Select **3** in the *Front-End Processor Switch* window under *FEP*.

4.   Select **Out** under *Switch*.

5.   Select **Yes** under *Backup*.

6.   Click on the **Save the current record** icon to execute the FEP switch process. The *Question* window displays:
Switch out the FEP FULLY offline ???

7.   Click on **OK** to continue. The system displays the "wristwatch" and the message:
"Requesting FEP Switchout"

8.   Monitor the *FEP3* and *BKUP System Status* icons and verify FEP3 is in backup mode and the *BKUP* icon displays the online status.

9.   Upon completion of the FEP switch process, repeat section 5.1, steps 1 and 2.

10.   Upon completion of the FEP backup mode channel operability verification, perform the following to display the *Front-End Processor Switch* window:

      a. Click on **Maintenance**.

      b. Click on **Front-End Processor Switch**.

11.   Select the following in the *Front-End Processor Switch* window:

      a. Under *FEP*: select **3**.

      b. Under *Switch*: select **IN** to switch FEP3 back in.

      c. Click on the **Save the current record** icon to execute the FEP switch process. The system displays the "wristwatch" and the message:
Requesting FEP switch-in

12.   Monitor the *FEP3* and *BKUP System Status* icons, to verify that FEP3 is online and the *BKUP* icon displays the backup mode status.

13.   When the system returns to normal operation, perform the following steps to close the *Front-End Processor Switch* window, and stop CRS:

      a. Select the following on the *Front-End Processor Switch* window:

           1) Click on **File**.

           2) Click on **Exit**.

      b. Select the following on the *Main CRS* menu:

1) Click on **System**.

2) Click on **Stop System**.

3) Click on **OK**.

4) Click on **Close**.

14. Monitor the *System Status* window, and verify the CRS application has stopped.

PART 6 ADDING NEW TRANSMITTER CHANNELS AND EDITING SITE DATABASE ASCII FILE PROCEDURES

6.1 Adding New Transmitter Channels Procedure

1. Click and hold the left mouse button on any white space, move the cursor to select **XCRS_SITE Utility**, and release the button to bring up the *XCRS_SITE Utility* window.

2. Click on **Select ASCII Site Setup** button to bring up the list of ASCII files.

3. Select the current site database ASCII file and double click.

4. Click on **Add Transmitter(s)** button to start the **addxmt** program. It displays how many channels currently are available, the next available channel to be added, and its appropriate processor and slot.

5. Use the following steps to add a new transmitter to the Site Database ASCII file:

   a. **Mnemonic**

      1) Type option number **1** and press **Enter** to select *Mnemonic*.

      2) Type **a** and press **Enter** at the prompt to add the *Mnemonic*.

      3) Type **mmmmm** and press **Enter** (where mmmmm is the desired *Mnemonic*), up to a length of 5 characters. The program returns the *Mnemonic*.

      4) Type **0** or press **Tab** and press **Enter** to complete the *Mnemonic* selection.

   b. **Call Sign**

      1) Type option number **2** and press **Enter** to select *Call Sign*.

      2) Type **a** and press **Enter** at the program prompt to add the *Call Sign*.

      3) Enter the *Call Sign* in the same manner as the *Mnemonic*, up to a length of 5 characters. The program returns the *Call Sign*.

      4) Type **0** or press **Tab** and press **Enter** to complete the *Call Sign* selection.

c. **Frequency**

    1) Type option number **3** and press **Enter** to select *Frequency*. The *Frequency* option only allows a selection of one of the seven choices listed.

    2) Type **n** and press **Enter** (where n is the desired *Frequency* choice). The program returns the *Frequency* choice by displaying an asterisk next to the *Frequency* selection.

    3) Type **0** or press **Tab** and press **Enter** to complete the *Frequency* selection.

d. **Location**

    1) Type option number **4** and press **Enter** to select *Location*.

    2) Type **a** and press **Enter** at the program prompt to add the *Location*.

    3) Enter the *Location* (in the same manner as the *Mnemonic* and the *Call Sign*), up to a length of 40 ASCII characters. The program returns the *Location*.

    4) Type **0** or press **Tab** and press **Enter** to complete the *Location* selection.

e. **Add Transmitter**

    1) Type option number **5** and press **Enter** to use all the parameters defined in the first four steps to configure a new transmitter in the database ASCII file. The program indicates that a new transmitter is really needed.

    2) Type **y** and press **Enter**. The program returns the assignment of each transmitter to its proper processor and slot. The program tells you the appropriate database ASCII file has been updated and the original has been saved with the .SAV extension.

6. The program then asks if another transmitter is needed. If so, repeat steps 5a through 5e for the next new transmitter. If not, type **n** and press **Enter** to exit the program.

6.2 Editing the Site Database ASCII File Procedure

1. When exit **addxmt** is done, the *Question* window displays:
Ready to recompile selected ASCII file. Continue?

2. Click on **Cancel** to close the *Question* window.

3. Select **Initialize System Configuration and Database** to ensure the entire system database and configuration is erased and replaced.

4.   Click on **Start Site Configure**. The *Question* window displays:
        Will now perform FULL site reconfiguration. Continue?

5.   Click on **OK** to recompile the database ASCII file. Upon completion of the
        database ASCII file recompile process, the system displays:
        Finished with site configure.

6.   Restart CRS by clicking on **Start CRS System**. The system displays:
        The CRS system will be STARTED. Continue?

7.   Click on **OK**. The "wristwatch" and the "working" message display. Several
        messages scroll by. The last message refers to starting 4BKUP, and the
        "wristwatch" and "working" message disappear.

8.   Click on **Exit** to close the *XCRS_SITE Utility* window.

9.   Open the *Alert Monitor* window:

        a. Click on **System**.

        b. Click on **Alert Monitor**.

NOTE: No attempt is made by **addxmt** to establish station identifiers, broadcast programs,
            broadcast suites, message types, voice parameters, keep alive messages, interrupt
            messages, etc. for the new transmitters. These must be configured through the CRS
            graphical user interface (see the *CRS Site Operator's Manual*) and updated in the site
            database ASCII file.

PART 7 ASM ALIGNMENT PROCEDURES

NOTE: The output of each added ASM card must be aligned before placing in service. The
            alignments must be performed in the following sequence:

            1. Verify ACP **Ref.** Mark Alignment.

            2. ASM Card Alignment.

7.1 Verify ACP Ref. Mark Alignment Procedure

NOTE: 1. The ACP Ref. mark alignment can be performed independently and does not
                require the use of any tool or equipment.

            2. Transmitter x in this procedure refers to the channel under test.

---

1.   Set up the CRS for BUL. No system database is required.

2.   Set the index mark on the **tone volume control** knob to the **Ref.** position.

3.   Push the **Transmitter x** and **Enable** buttons in sequence to start BUL on channel x. The buttons are located in the **BACKUP LIVE** block area on the ACP front panel.

NOTE: 3.   Do not send audio to a transmitter while performing this procedure.

---

4.   Push the **Alert Tone 1** button to generate the 1050 Hz warning alert tone (WAT).

5.   Ensure the VU meter on the ACP front panel indicates **0 dBm**.

NOTE: 4.   The duration of 1050 Hz WAT is 10 seconds.

---

6.   Adjust the tone volume control for a reading of **0 dBm**.

7.   Repeat steps 4, 5, and 6 as necessary to obtain a reading of **0 dBm**.

NOTE: 5.   When the tone volume control is set to the true Ref. position, the ACP provides the selected WAT output level of **0 dBm**.

---

8.   To stop BUL, first push the **Enable** button, then push the **Transmitter x** button.

7.2 ASM Card Alignment Procedure

NOTE: 1.   This alignment requires two people: one in the operations room and one in the equipment room.

2.   When performing any of the following alignments, the system's output(s) must be disconnected from the telecommunications link and terminated into a 600-ohm load. All audio signal level measurements are taken across the 600-ohm load.

---

1.   Assemble the following required equipment:

  • dB meter to read the audio signal level
  • small jeweler's screwdriver
  • 600-ohm dummy load with RJ-11 plug attached

2.   Set up the CRS for BUL. No system database is required.

3. Set the index mark on the tone volume control knob to the **Ref.** position as described in section 7.1, Verify ACP Ref. Mark Alignment Procedure.

4. Push the **Transmitter x** and **Enable** buttons in sequence to start BUL on channel x. The buttons are located in the **BACKUP LIVE** block area on the ACP front panel.

5. Plug the RJ-11 connector (with the 600-ohm load attached) into the RJ-11 jack of **OUT1** on the ASM of transmitter x (output channel x).

6. Connect the dB meter across the 600-ohm load.

7. Push the **Alert Tone 1** button to send a WAT to the **OUT1** jack of ASM card 1.

8. Measure and record the signal level in dB across the 600-ohm load.

9. Using a small jeweler's screwdriver, adjust the transmitter gain control potentiometer through the ASM front panel until a reading of **0 dBm** is obtained across the 600-ohm load.

NOTE: 3. Table 4 provides equivalent V rms and V p-p values related to dBm (all referenced to 600-ohms) as an aid in referencing readings taken with measurement equipment that may not read directly in dBm.

Table 4. Voltages <u>vs</u> dBm (into 600-ohm load)

dBm	RMS	P-P	dBm	RMS	P-P	dBm	RMS	P-P
10	2.440	6.93	-4	0.480	1.35	-17	0.110	0.301
9	2.183	6.17	-5	0.430	1.20	-18	0.097	0.270
8	1.946	5.50	-6	0.390	1.03	-19	0.087	0.240
7	1.734	4.90	-7	0.345	0.96	-20	0.0775	0.215
6	1.546	4.37	-8	0.306	0.85	-21	0.690	0.194
5	1.377	3.89	-9	0.275	0.76	-22	0.061	0.170
4	1.228	3.47	-10	0.245	0.68	-23	0.054	0.152
3	1.094	3.01	-11	0.213	0.61	-24	0.048	0.135
2	0.975	2.75	-12	0.192	0.54	-25	0.043	0.120
1	0.869	2.46	-13	0.173	0.48	-26	0.039	0.108
0	0.775	2.15	-14	0.154	0.43	-27	0.034	0.096
-1	0.690	1.94	-15	0.138	0.38	-28	0.031	0.085
-2	0.610	1.70	-16	0.125	0.34	-29	0.028	0.076
-3	0.540	1.52				-30	0.024	0.068

NOTE: 4. The WAT output from the ACP nominally lasts 10 seconds. It is recommended that a second person push the **Alert Tone1** button for a near continuous tone output. This will smooth out the calibration effort and minimize the time required.

5. Primary (OUT1) and secondary (OUT2) outputs are two independent outputs. However, the output level of OUT1 is affected by approximately 1.5 dB if OUT2 is loaded.

6. During BUL, the VU meter monitors the ACP tone output, not the output of the ASM card. The ACP tone output is sent to the ASM card via the ASC for final output.

10. Repeat steps 7, 8, and 9 as necessary to obtain a reading of **0 dBm** for the channel under test.

11. To stop BUL, first push the **Enable** button, and then push the **Transmitter x** button.

12. Repeat steps 1 through 10 to align each of the new ASM cards in the system.

13. Remember to activate each ASM card output by pushing the respective **Transmitter x** button, and then the **Enable** button.

Attachment C

**New Configuration
Physical Verification**

Attachment C
New Configuration Physical Verification

10 Channel System

Required MPs, FEPs, DECtalks, ASC, and ASMs

The **MAXIMUM-10** system has two MPs (0MP and 5MP), four FEPs (1FEP, 2FEP, 3FEP, and 4BKUP), sixteen DECtalk cards, one ASC card, and thirteen ASM cards:

0MP	main processor 1		
5MP	main processor 2		
1FEP	front end processor 1		
	LAN Card	LAN interface	(EISA slot 1)
	DECtalk 1	channel 1	(EISA slot 2)
	DECtalk 2	channel 2	(EISA slot 3)
	DECtalk 3	channel 3	(EISA slot 4)
	DECtalk 5	PB1	(EISA slot 6)
2FEP	front end processor 2		
	LAN Card	LAN interface	(EISA slot 1)
	DECtalk 1	channel 4	(EISA slot 2)
	DECtalk 2	channel 5	(EISA slot 3)
	DECtalk 3	channel 6	(EISA slot 4)
	DECtalk 5	PB2	(EISA slot 6)
3FEP	front end processor 3		
	LAN Card	LAN interface	(EISA slot 1)
	DECtalk 1	channel 7	(EISA slot 2)
	DECtalk 2	channel 8	(EISA slot 3)
	DECtalk 3	channel 9	(EISA slot 4)
	DECtalk 5	channel 10	(EISA slot 6)
4BKUP		backup front end processor	
	LAN Card	LAN interface	(EISA slot 1)
	DECtalk 1	backup channel 1, 4, or 7	(EISA slot 2)
	DECtalk 2	backup channel 2, 5, or 8	(EISA slot 3)
	DECtalk 3	backup channel 3, 6, or 9	(EISA slot 4)
	DECtalk 5	backup PB1, PB2, or 10	(EISA slot 6)

ASA	audio switch assembly		
	ASC	audio switch controller	
	ASM 1	channel 1	(slot 1)
	ASM 2	channel 2	(slot 2)
	ASM 3	channel 3	(slot 3)
	ASM 4	channel 4	(slot 4)
	ASM 5	channel 5	(slot 5)
	ASM 6	channel 6	(slot 6)
	ASM 7	channel 7	(slot 7)
	ASM 8	channel 8	(slot 8)
	ASM 9	channel 9	(slot 9)
	ASM 10	channel 10	(slot 10)
	ASM PB1	monitor/playback channel 1	(slot PB1)
	ASM PB2	monitor/playback channel 2	(slot PB2)
	ASM Spare	spare	(slot S)

DECtalk Card Configurations

There is one I/O jumper to be set on each DECtalk card:

	FEP Name	FEP EISA Slot #	I/O Address Jumper
1FEP DECtalk 1 (channel 1)	1FEP	2	240
1FEP DECtalk 2 (channel 2)	1FEP	3	250
1FEP DECtalk 3 (channel 3)	1FEP	4	328
1FEP DECtalk 5 (mon/playback chan 1)	1FEP	6	380
2FEP DECtalk 1 (channel 4)	2FEP	2	240
2FEP DECtalk 2 (channel 4)	2FEP	3	250
2FEP DECtalk 3 (channel 6)	2FEP	4	328
2FEP DECtalk 5 (mon/playback chan 2)	2FEP	6	380
3FEP DECtalk 1 (channel 7)	3FEP	2	240
3FEP DECtalk 2 (channel 8)	3FEP	3	250
3FEP DECtalk 3 (channel 9)	3FEP	4	328
3FEP DECtalk 5 (channel 10)	3FEP	6	380
4BKUP DECtalk 1	4BKUP	2	240
4BKUP DECtalk 2	4BKUP	3	250
4BKUP DECtalk 3	4BKUP	4	328
4BKUP DECtalk 5	4BKUP	6	380

ASM Card Configurations

There are five jumpers to be set on each ASM card:

	ASA Slot #	Silence Alarm Jumper "JP1"	ACP Channel Sel. Jumper "JP2" & "JP3"	BKUP Live/ Playback Cntrl Jumper "JP4"	FEP Select Jumper "JP5"
ASM 1 (channel 1)	1	EN (Enable)	1	BUL2	FEP1
ASM 2 (channel 2)	2	EN (Enable)	2	BUL2	FEP1
ASM 3 (channel 3)	3	EN (Enable)	3	BUL2	FEP1
ASM 4 (channel 4)	4	EN (Enable)	4	BUL2	FEP2
ASM 5 (channel 5)	5	EN (Enable)	5	BUL2	FEP2
ASM 6 (channel 6)	6	EN (Enable)	6	BUL2	FEP2
ASM 7 (channel 7)	7	EN (Enable)	7	BUL2	FEP3
ASM 8 (channel 8)	8	EN (Enable)	8	BUL2	FEP3
ASM 9 (channel 9)	9	EN (Enable)	9	BUL2	FEP3
ASM 10 (channel 10)	10	EN (Enable)	10	BUL2	FEP3
ASM PB1 (mon/playback chan 1)	PB1	DIS (Disable)	PB1	PB	FEP1
ASM PB2 (mon/playback chan 2)	PB2	DIS (Disable)	PB2	PB	FEP2

Cable Label Between DECtalk Card and ASM Card

From	To	Cable Label
1FEP DECtalk 1 "J2" Port	ASM 1 "IN Port"	1-1
1FEP DECtalk 2 "J2" Port	ASM 2 "IN Port"	1-2
1FEP DECtalk 3 "J2" Port	ASM 3 "IN Port"	1-3
2FEP DECtalk 1 "J2" Port	ASM 4 "IN Port"	2-1
2FEP DECtalk 2 "J2" Port	ASM 5 "IN Port"	2-2
2FEP DECtalk 3 "J2" Port	ASM 6 "IN Port"	2-3
3FEP DECtalk 1 "J2" Port	ASM 7 "IN Port"	3-1
3FEP DECtalk 2 "J2" Port	ASM 8 "IN Port"	3-2
3FEP DECtalk 3 "J2" Port	ASM 9 "IN Port"	3-3
3FEP DECtalk 5 "J2" Port	ASM 10 "IN Port"	3-5
1FEP DECtalk 5 "J2" Port	ASM PB1 "IN Port"	1-5
2FEP DECtalk 5 "J2" Port	ASM PB2 "IN Port"	2-5

Cable Label Between DECtalk Card and ASC Card

From	To	Cable Label
4BKUP DECtalk 1 "J2" Port	ASC "BKUP Audio 1" Port	4-1
4BKUP DECtalk 2 "J2" Port	ASC "BKUP Audio 2" Port	4-2
4BKUP DECtalk 3 "J2" Port	ASC "BKUP Audio 3" Port	4-3
4BKUP DECtalk 5 "J2" Port	ASC "BKUP Audio 5" Port	4-5

Attachment D

WS Form A-26 Sample

WS FORM A-26 (4/94)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE

ENGINEERING MANAGEMENT REPORTING SYSTEM
MAINTENANCE RECORD

Document Number
G 49986

General Information	1. Open Date	Time	2. Initials	3. Response Priority (check one)		4. Close Date	Time
	2 / 22 /01	**0900**	**JMM**	○ Immediate ○ Low	○ Routine ⊠ Not Applicable	**2 / 22 /01**	**1400**

5. Description
Expand CRS from a Large 6 to a Maximum 10 Configuration

Equipment Information	6. Station ID	7. Equipment Code	8. Serial Number	9. TM	10. A T	11. How Mal.
	LZK	**CRSSA**	**001**	**M**	**M**	**999**

12. EQUIPMENT OPERATIONAL STATUS TIMES	a. Fully Operational	b. Logistics Delay Partly Operational	c. All Other	d. Logistics Delay Not Operational	e. All Other

13. Parts Failure Information

Block #	a. ASN	b. NSN	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.
1							
2							
3							
4							
5							

14. Work Load Information

Type	Staff Hrs.
a. Routine	
b. Non-Routine	
c. Travel	
d. Misc.	**5:00**
e. Overtime	

Miscellaneous Information	15. Maintenance Comments **Installed 4 DECTalk cards and 4 ASM cards to expand CRS from a Large 6 to a Maximum 10 configuration, I.A.W. Mod Note 54**	16. Initials **JMM**

17. SPECIAL PURPOSE REPORTING	a. Mod. No. **54**	b. Mod./Act./Deact.Date **2/22/01**	c.	d.	e.

18. CONFIGURATION MGMT. REPORTING (use as directed)	ASN		Vendor Part No. (New Part)	Serial Number (Old Part)	Serial Number (New Part)